Iowa Farm Science

Volume 6 | Number 5 Article 2

11-1951

Marketing Alfalfa-Brome Through Steers

J. M. Scholl
Iowa State College

C. W. McDonald
Iowa State College

Earl O. Heady
Iowa State College

Marketing Alfalfa-Brome Through Steers

With greater acreages of grasses and legumes comes a problem—that of finding a profitable market for this forage. What are the best ways to manage pastures and cattle to get highest returns? Here's a report on our progress so far.

by J. M. Scholl, C. W. McDonald and Earl O. Heady

WHEN YOU grow more grasses and legumes in the crop rotation, then you need to find a profitable market for this extra forage. One way to sell it is to turn it into beef. But what are the best ways to manage pastures and cattle to get highest returns?

To get highest profits in farming, you must fit your cropping and livestock programs to your capital, labor and land resources. Also, you have to consider your own abilities as a manager.

Most Iowa farmers have many alternatives to choose from in organizing their crop and livestock programs. No one organization of the farm business is best for every operator and every farm.

This article reports the results from several different systems of forage and pasture utilization. These systems are not represented as the feeding systems most profitable for *all* farms and *all* price relationships. However these results do suggest how different feeding programs may fit into different farm situations.

New studies now underway eventually will provide information on other types of cattle and other forage-feeding systems. The results of the study reported here deal with choice yearling steers. But before we look at these results, let's consider the farm management or profit angles of feeding systems or rations.

Best Rotation?

The best rotation for your farm depends as much upon the way in which feeds substitute for each other in the ration or feeding as it depends upon the soil itself. The best rotation and the best ration or feeding system are not things you can decide independently—one depends upon the other. Here's why:

First, grain and forage crops can be *complementary* in the rotation—that is, by growing more hay, the soil may be improved so that you may be able to grow more grain on the same land. The result is an increase in both hay and grain yields. You needn't worry about using forage when it is complementary with grain. You can simply let the hay go down as green manure and still increase profits. By growing more complementary hay, you can increase the value of the grain produced and at the same time lower your total cost of production.

So even if you don't utilize it, complementary hay is profitable. Still, if you're able to feed this hay and sell it at a profit, you're able to add that much more to your income.

May Compete

But hay or pasture also can *compete* with grain—that is, an increase in hay and forage acreage results in fewer total bushels of grain. This is where the livestock system becomes important. Whether or not forage should be grown at the expense of grain depends upon how the two substitute both in the rotation and in the ration.

Suppose, for example, that a shift from one rotation to another means

J. M. SCHOLL is associate professor of agronomy (farm crops). C. W. McDONALD is associate professor of animal husbandry. EARL O. HEADY is professor of agricultural economics.

that you'll get 1 pound less grain for each extra 2 pounds of hay you gain. Now if you can substitute 1½ pounds of hay for 1 pound of grain by shifting from a high-grain feeding system to a high-forage system, then you can produce more beef and likely more profit by growing more hay even when it competes with grain.

If it takes 5 pounds of forage to substitute for 1 pound of grain in the feeding system, the change in the rotation isn't likely to be profitable. It would result in a smaller rather than a larger production from a given acreage.

Another important aspect of any rotation is its effect on soil productivity. Here we've been studying, at the Soil Conservation Experimental Farm at Clarinda, a C-C-O-M-M rotation. We've been obtaining information on the effect of forage on the yield of other grain crops in the rotation. These effects increase over time, and additional results will be reported later.

Results So Far . . .

Up to now our results have been obtained with choice yearling steers only. We recognize that the methods compared up to this time are not the only nor necessarily the best ones. And, because seasons vary so greatly, it will be necessary that we continue our studies for a number of years to come.

But after 5 years of producing beef from choice feeder steers on alfalfa-bromegrass pastures under different grazing systems, here's what we can say right now:

- Grazing alfalfa - bromegrass pastures during May and June and then self-feeding ground ear corn has given greatest returns over feed costs with choice yearling steers under the conditions of this particular study.
- Rotation grazing has shown no superiority over continuous grazing.
- Controlled grazing showed these advantages over continuous grazing: (1) Surplus feed is preserved and made available for feeding later in the summer if needed; (2) quality of the pasture is improved with mowing; (3) controlled grazing produced higher gains for the entire season with pronounced superiority during the July-August period.
- Second-year pastures produce more hay per acre than first-year pastures. However, first-year pastures contain a higher percentage of alfalfa, a more even distribution of growth through the season and produced more *beef* per acre.
- The most profitable system, when considered from the standpoint of the farm as a whole, may or may not be the one which returns the greatest margin per steer. The most profitable feeding system depends as much on the crops grown and their relationship to each other as upon the feeding system itself. We cannot say more about the most profitable rotation and feeding system until results are available from additional years.

What We've Done

We compared the following methods of utilizing and marketing forage produced on alfalfa-bromegrass pastures as feed for fattening beef cattle:

Drylot: Ground ear corn, self-fed, plus 1 pound of commercial protein supplement, hand-fed once daily, plus 4 pounds of grass-legume hay per head daily, after cattle were on full feed. Cattle were fed an average of 151 days and were marketed the first week in October in Good to Choice condition.

Fed-on-pasture: Pasture without grain for the first 56 days. Cattle were then brought to a full-feed of ground ear corn and self-fed on pasture until about October 1 and later finished in drylot. They required about 30 days of drylot feeding to make them as good as the drylot cattle.

Continuous grazing: Cattle grazed without grain until about the end of the pasture season. They were brought to a full-feed of ground ear corn on pasture at the end of the pasture season and were finished in drylot. An average of about 1½ acres of pasture were available per steer. Steers required an average of 68 days on full-feed to reach Good to Choice grade.

Rotation grazing: Cattle handled like continuous-grazed cattle except that the pasture was subdivided into three parts. Steers were shifted from one part to another about every 3 weeks. These cattle had an average of about 1⅓ acres available per steer. We studied this system in 1946, 1947 and 1948.

Controlled grazing: Cattle had the same acreage allotment—about 1½ acres available per steer—as with the continuous-grazing method. But the pasture was divided. Grass silage was made from half of the area, and cattle grazed the other half. After pasture had recovered from mowing, cattle had access to the entire area—the full 1½ acres per steer available. Finally cattle were started on full-feed and finished in drylot as under the continuous-graze method. We substituted this system for rotation grazing in 1949 and 1950.

How Results Compared

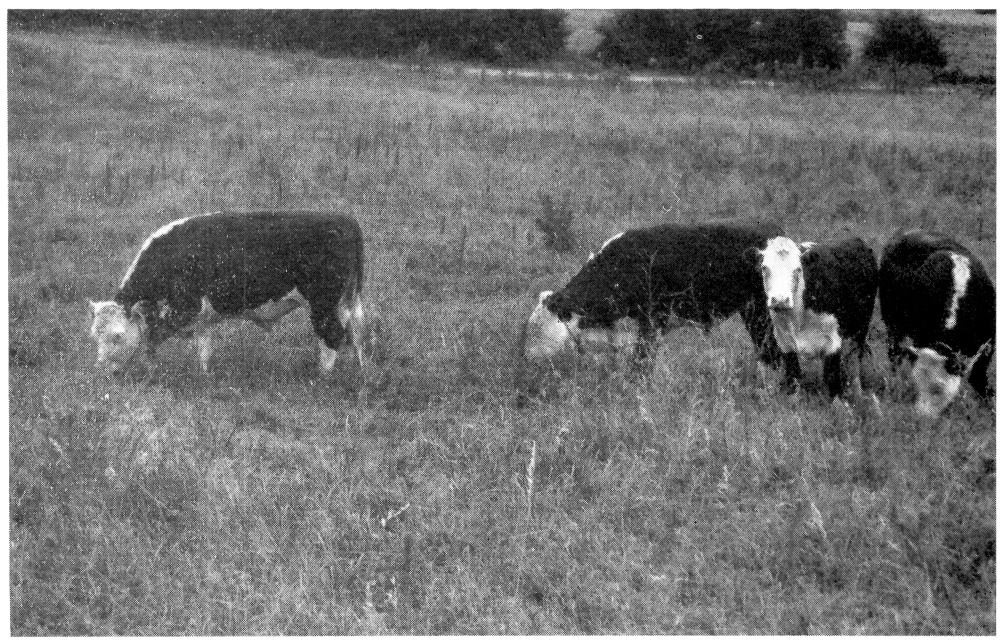
May and June gains: All cattle made their best gains in May and June when about 60 percent of the season's total pasture growth was produced. They made almost 50 percent of their total gain during this period which was about 40 percent of the total period on pasture. In 1946, 1947 and 1948, all cattle made the same gains—slightly more than 2 pounds daily—for this period.

For the remainder of the season, the fed-on-pasture cattle, which were receiving grain, continued to gain over 2 pounds per day, while the continuous-grazed cattle gained 1⅓ pounds per day and the rotation-grazed cattle gained slightly over 1 pound daily. Fed-on-pasture cattle had ¾ acre of pasture available per steer, while the others had access to 1½ acres per steer.

The rotation-grazing system failed to show any advantage over the continuous-grazing system. But the fed-on-pasture system did show definite superiority. These cattle utilized their pasture when it was at its peak, wasted less forage and received supplementary feed when pastures lagged in July and August. The fed-on-pasture cattle were the most profitable during the 5 years under the conditions of the study.

The other cattle on pasture had a surplus of feed in May and June, wasted more forage and made slower gains in July and August—when the quality of the pasture growth was lower because of dry weather

These steers were fed in drylot beginning May 7. They were ready for market in 60 days and were sold on October 6. Total gain was 308 pounds in 153 days. (Picture was taken on August 6.)



This pasture was grazed continuously. At the time picture was taken (August 6), steers had received no corn, but note they're in good condition. Corn feeding was begun on August 25. Cattle were fed on pasture for 30 days and then finished in drylot. Total gain was 377 pounds in total of 221 days.

These steers had pasture only until July 1 when they started getting corn on pasture. Note self-feeder in left background. Steers were self-fed on pasture for 85 days and then finished in drylot. Total gain was 337 pounds in total of 181 days. (Picture was taken on August 6.)

and advancing maturity of the grasses and legumes.

Management Made Difference

These results suggested the idea of substituting for the rotation-grazing system a method which would preserve the surplus feed as hay or silage and make available high-quality pasturage from the second growth. So in 1949 and 1950, we replaced the rotation-grazing system with the controlled-grazing method.

Controlled grazing showed these advantages over continuous grazing: (1) Gains for the pasture season were 1.9 pounds per day compared with 1.7 pounds for continuous grazing; (2) daily gains for July and August were 2 pounds for controlled grazing and 1.5 pounds for continuous grazing; (3) surplus feed was preserved and was available for feeding later in the season; (4) controlled-grazing cattle made 215 pounds of beef per acre in the 120 days before corn feeding was started compared with 150 pounds for continuous grazing.

Pastures Compared

Good stands of bromegrass and pasture were established each year. First-year pastures always contained a higher percentage of alfalfa (dry-weight basis) than second-year pastures—about 60 percent for first-year and 35 percent for second-year. Bromegrass was more productive in its second year, but alfalfa stands were somewhat reduced especially in closely grazed areas.

Although second-year pastures consistently outyielded first-year pastures in hay production, first-year pastures produced a better seasonal distribution of growth.

For example, by the first week in July, second-year pastures had produced 64 percent of their total growth compared with first-year pastures with 52 percent. This fact, combined with first-year higher legume content, has meant that quality of first-year pastures has been superior—resulting in cattle gains of 287 pounds per steer on first-year and 252 pounds on second-year pastures.

5-Year Gains, Costs

See table 1 for a summary of weights, gains, feed requirements and costs of gains per steer for the 5 years of the study.

The number of days the cattle were on test varied with the management systems, since all cattle were fed to the same degree of finish. Fed-on-pasture cattle required 30 days longer than drylot cattle, and other pasture methods required 76 days longer to reach the same finish.

Daily gains were highest for drylot and fed-on-pasture cattle and lowest for the methods that did not include grain feeding. Methods, not including grain feeding, also required more time.

Savings in harvested feeds decidedly were greater for those methods utilizing pasture for the longer periods. But when the cost of these harvested feeds was added to the charge for pastures, the total cost per steer for all systems did not differ greatly. Pastured cattle sold at higher weights, but the selling price was highest for drylot cattle. During the 5 years of the study, cheapest gains were obtained from the systems using high amounts of pasture—but at the sacrifice of time.

Not Always Same

No one of the feeding systems studied and reported here is the most profitable for every single year. In some years drylot feeding systems will return most; any break in market prices in early fall will favor drylot over the systems involving feeding on pastures. On the other hand, summer grazing with later finishing in drylot may easily return most in years when prices are rising. So the best system to be selected will depend a great deal on the price outlook.

To see how the system studied here might have worked out in the past, we've gone back and applied prices of the last 31 years (see table 2).

In some years the drylot system would have paid off most on this basis. In other years the cattle fed on grass or those grazed on pasture and later fed out in drylot would have been more profitable.

The figures in table 2 also suggest the degree of risk associated with the different systems—the figures indicate what the past chances were for breaking even or better under the different systems.

Looking at the first columns in table 2, we see that in 17 years of the 31, the drylot system would have returned less than $100 for each $100 in total cost, including feed, labor, interest and depreciation on equipment, and interest on the steers. Losses, when figured in this manner, would have come about in only 13 years for cattle fed on pasture and only 12 years for cattle grazed and then fed out.

Only in 1 of 31 years would the

Table 1
Weights, Gains, Feed Consumption and Cost of Gains Per Steer. Five-Year Average, 1946-50. Clarinda.

	Drylot throughout	Fed-on-pasture after 56 days	Controlled grazing*	Continuous grazing
Total days fed	151	181	227	227
Initial weight (May)	787	787	784	785
Sale weight (Omaha)	1069	1120	1150	1160
Total gain (lbs.)	282	333	366	375
Average daily gain (lbs.)	1.87	1.84	1.61	1.65
Feed consumed:				
Ground ear corn (bu.)	47.5	41.3	30.8	31.6
Protein supplement (lbs.)	148	39	73	73
Hay (lbs.)	730	173	334	334
Pasture (acres)**	—	0.79	1.28	1.52
Cost of feed and pasture†	$93.25	$90.34	$86.17	$91.27
Costs per 100 lbs. gain	$33.07	$27.13	$23.54	$24.34
Feed saved per acre pasture	——	$26.01	$30.27	$24.07

* Includes rotation grazing (1946, 1947 and 1948) and controlled grazing (1949 and 1950).

** Controlled grazing cattle not charged for area producing grass silage during the time it was producing silage.

† The cost of protein supplement hay and corn based on prices paid when purchased. Pasture charge based on the value of hay produced on the pastures, less the cost of harvesting.

Table 2

How Income From Three Different Cattle Feeding Systems Compared Over 31 Years

Returns per $100 of ALL costs	Feeding system	No. of years out of 31 that this income was earned
Less than $60	Drylot	2
	Fed-on-pasture	1
	Cont. graze	3
$60 to $79	Drylot	6
	Fed-on-pasture	6
	Cont. graze	3
$80 to $99	Drylot	9
	Fed-on-pasture	6
	Cont. graze	6
$100 to $119	Drylot	6
	Fed-on-pasture	7
	Cont. graze	9
$120 to $139	Drylot	2
	Fed-on-pasture	5
	Cont. graze	2
$140 to $159	Drylot	6
	Fed-on-pasture	3
	Cont. graze	4
$160 to $179	Drylot	None
	Fed-on-pasture	3
	Cont. graze	3
$180 to $199	Drylot	None
	Fed-on-pasture	None
	Cont. graze	1
$200 to $219	Drylot	1
	Fed-on-pasture	1
	Cont. graze	None
$220 to $239	Drylot	None
	Fed-on-pasture	None
	Cont. graze	1
$240 and over	Drylot	None
	Fed-on-pasture	None
	Cont. graze	None

Returns per $100 of feed and labor costs	Feeding system	No. of years out of 31 that this income was earned
Less than $60	Drylot	1
	Fed-on-pasture	1
	Cont. graze	2
$60 to $79	Drylot	5
	Fed-on-pasture	1
	Cont. graze	1
$80 to $99	Drylot	5
	Fed-on-pasture	5
	Cont. graze	4
$100 to $119	Drylot	8
	Fed-on-pasture	7
	Cont. graze	6
$120 to $139	Drylot	5
	Fed-on-pasture	6
	Cont. graze	7
$140 to $159	Drylot	1
	Fed-on-pasture	4
	Cont. graze	1
$160 to $179	Drylot	5
	Fed-on-pasture	2
	Cont. graze	3
$180 to $199	Drylot	1
	Fed-on-pasture	5
	Cont. graze	4
$200 to $219	Drylot	None
	Fed-on-pasture	None
	Cont. graze	2
$220 to $239	Drylot	None
	Fed-on-pasture	None
	Cont. graze	1
$240 and over	Drylot	1
	Fed-on-pasture	1
	Cont. graze	1

Returns per $100 feed fed	Feeding system	No. of years out of 31 that this income was earned
Less than $60	Drylot	1
	Fed-on-pasture	1
	Cont. graze	2
$60 to $79	Drylot	4
	Fed-on-pasture	None
	Cont. graze	1
$80 to $99	Drylot	5
	Fed-on-pasture	6
	Cont. graze	3
$100 to $119	Drylot	5
	Fed-on-pasture	2
	Cont. graze	5
$120 to $139	Drylot	7
	Fed-on-pasture	9
	Cont. graze	7
$140 to $159	Drylot	3
	Fed-on-pasture	3
	Cont. graze	2
$160 to $179	Drylot	1
	Fed-on-pasture	3
	Cont. graze	3
$180 to $199	Drylot	5
	Fed-on-pasture	3
	Cont. graze	4
$200 to $219	Drylot	None
	Fed-on-pasture	2
	Cont. graze	1
$220 to $239	Drylot	None
	Fed-on-pasture	2
	Cont. graze	2
$240 and over	Drylot	1
	Fed-on-pasture	1
	Cont. graze	2

drylot system have returned more than $160 for each $100 in total costs. The pasture feeding system would have returned $160 or more in 4 of the years, while it's 5 years for cattle grazed on pasture and then fed out.

Some farmers feed cattle mainly to get a profit on their feed and labor. We've prepared the second set of columns on this basis—showing the return per $100 of feed and labor costs.

Here the drylot system would have given a return of less than the outlay for feed and labor in 11 of the 31 years; and in 7 of the 31 both for cattle fed on pasture and for those grazed and then fed out.

Finally since some farmers have ample labor on hand and feed cattle for the returns they can get on hay and grain, we've figured the third set of columns on the basis of returns over feed costs.

This way the drylot system would have returned less than the value of the feed in 10 of the 31 years. Cattle fed on grass would have resulted in a loss in only 7 and grazed cattle in only 6 of the 31 years. Grazed cattle and pasture-fed cattle would have returned $200 or better for each $100 feed fed in 5 years, while the drylot cattle would have given returns this great in only 1 year.

Fit Resources, Outlook

Table 2 simply indicates again that we must fit the particular feeding system to our resources and the price outlook. Looking back, we found that the grazing system gave greater returns when cattle prices were rising throughout the fall months; and this has been true in about 15 of the past 20 years.

If it weren't for price changes, perhaps one single system would always pay best. But since prices do change, it's necessary to keep your eye geared to the outlook.

Investment Needed

Another point to consider is the amount of investment required to utilize forage under different systems. For comparison see the following figures. To put all systems on a comparable basis, we've put these figures in terms of forage (or its equivalent in terms of pasture yields).

Investment in Cattle Required to Utilize 100 Tons of Forage Under Three Feeding Systems

System	1931-35 prices	1937-41 prices	1944-51 prices
Drylot	$2,273	$3,186	$5,884
Fed on pasture	1,236	1,729	3,200
Grazed and fed out	917	1,283	2,374

The young farmer who's short on capital may prefer the longer grazing system in terms of capital investment. Not only is the investment required to utilize a given amount of forage less but also a smaller "stake" is involved if prices should take an unfavorable turn.

But the farmer who has ample capital or is in a favorable debt position and able to stand greater risks may prefer investment in the drylot or pasture-feeding systems since the turnover here is more rapid.

Work to Continue

Let us repeat that the methods compared in this study are not the only, nor necessarily the best ones. Also these results were obtained with choice yearling steers only. And because seasons vary so greatly, it will be necessary to continue further studies for a number of years.

Our tests are being continued with choice Hereford steer calves for another 5 years. Methods of utilizing alfalfa-bromegrass pastures being studied are: (1) full-fed on pasture; (2) fed-on-pasture after 56 days; (3) controlled grazing; and (4) continuous grazing. Drylot cattle will serve as a check.

If you're interested in more detailed information about this study up to the present time, write to the Department of Agronomy, Iowa State College, and ask for Mimeograph FSR-38S.

Still More Inflation Ahead?

THERE'S been a lull in inflation since February. But it's about over. Arms spending is moving steadily upward. In July 1950 it was at the rate of about $13 billion yearly. By March 1951 it was up to the yearly rate of almost $30 billion. In October it hit $40 billion. And by mid-1952 it is scheduled to reach $65 billion.

What's more, businessmen are spending more money for new plants and equipment: The yearly rate of spending the last 3 months of 1951 is over $25 billion—compared with a rate of $20 billion during the first 3 months of 1951.

Wholesale prices are stiffening. After a slack summer, retail sales showed more than a normal fall seasonal upturn. Stores now expect a brisk Christmas trade. Some think it may set a new record.

By next spring the nation's economy should be humming in high gear. Industrial production and personal income may hit a new postwar peak by then. Last spring businessmen feared the large stocks of durable goods on inventory as a possible cause of recession. Those fears are disappearing. Today they're viewed more as a bulwark against the inroads of demand in the months ahead.

Does this mean that we're about to take off on another inflationary binge? (The consumers' price index [cost-of-living] shot up 9 percent from June 1950 to February 1951—and half of that rise came in the 3 months just preceding February.)

The Federal Reserve Bank of Chicago thinks not: "To the extent that the inflationary forces reassert themselves this fall and winter, the course of events is likely to be smoother and saner than in the earlier months." Another stabilizer will be the trend in consumer saving. Savings have been about double the rate of the first few months of the year. This has been an important cause of the easing in inflationary pressures since February.

Who Gets the Family Farm?

Will your farm make trouble for your children after your death? Take the necessary action now to make sure it remains a going concern.

by John F. Timmons

WHO WOULD own and operate your farm if you died today?

Would your surviving wife or husband be provided a living during their remaining years?

How would your son or daughter remaining on the home farm fare?

Would your farm property benefit or bring troubles to your family?

It's time to work out answers to these kinds of questions in the best interests of your family's future welfare and happiness.

Sooner or later, all farm-owning parents and their children must face problems of transferring the home farm within the family. These problems arise out of the continuity of rights in farm property beyond the lives of present owners.

Some parents work out a farm property transfer program adapted to the needs and resources of the family. Many more parents fail to plan for the distribution of their property. Quite often this leads to unsatisfactory—and sometimes serious—results for the heirs.

JOHN F. TIMMONS is professor of agricultural economics.

Growing Concern

Fortunately, an increasing number of Iowa farm families are becoming concerned with what will happen to their farm property. Most of them are earnestly searching for ways and means of getting their property transferred to the next generation with the least expense and difficulty in the process. There are several reasons for this.

First, more Iowa farmers than ever before own their farms. Second, Iowa farm owners have larger equities in their farms than ever before. Third, more farm estates are being subjected to higher estate and inheritance taxes as a result of higher taxes and higher farm values. Fourth increasing income taxes frequently mean that the owner can expect for his family